Method and System for Provisioning
Non-Preemptible Unprotected Traffic in a
Bi-Directional Ring
Inventor: Jason P. Kettinger
Attorney's Docket: 064731.0181
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FIG. 1

FIG. 2

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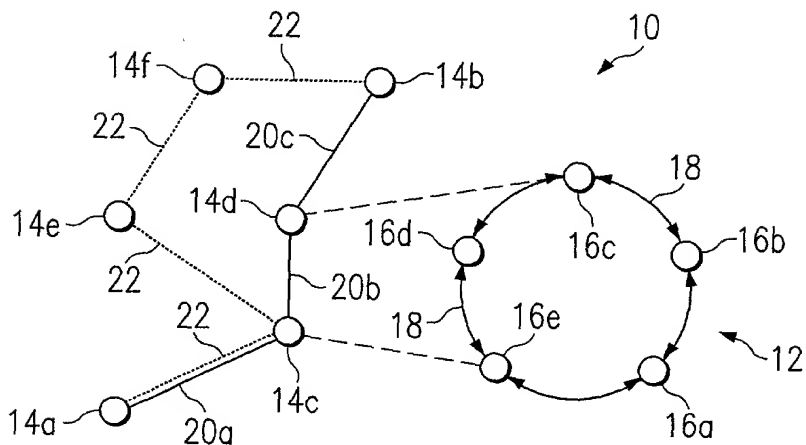Sheet: 2 of 7   Filed: April 30, 2001

FIG. 3A

START

300 — UPDATE MODIFIABLE NUT TABLE

302 — COMPARE MODIFIABLE NUT TABLE TO NUT TABLE COPY

304 — DIFFERENT? — NO

YES

306 — COMPARE NUT PROVISIONING TO CROSS-CONNECT PROVISIONING

308 — CONFLICT? — YES

NO

310 — NUT PROVISIONING STATUS? — MANUAL

AUTO

312 — WRITE MODIFIABLE NUT TABLE TO NUT TABLE

OFF

314 — STATUS = IDLE? — NO

YES

316 — PROCESSING IDLE K-BYTES ? — NO

YES

FROM FIG. 3B — D

318 — N=1

FROM FIG. 3B — C

320 — C=1

322 — START TIMER

TO FIG. 3B — B

TO FIG. 3B — A

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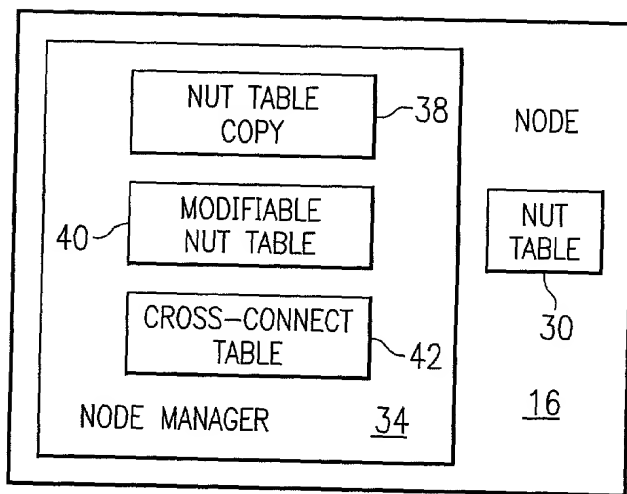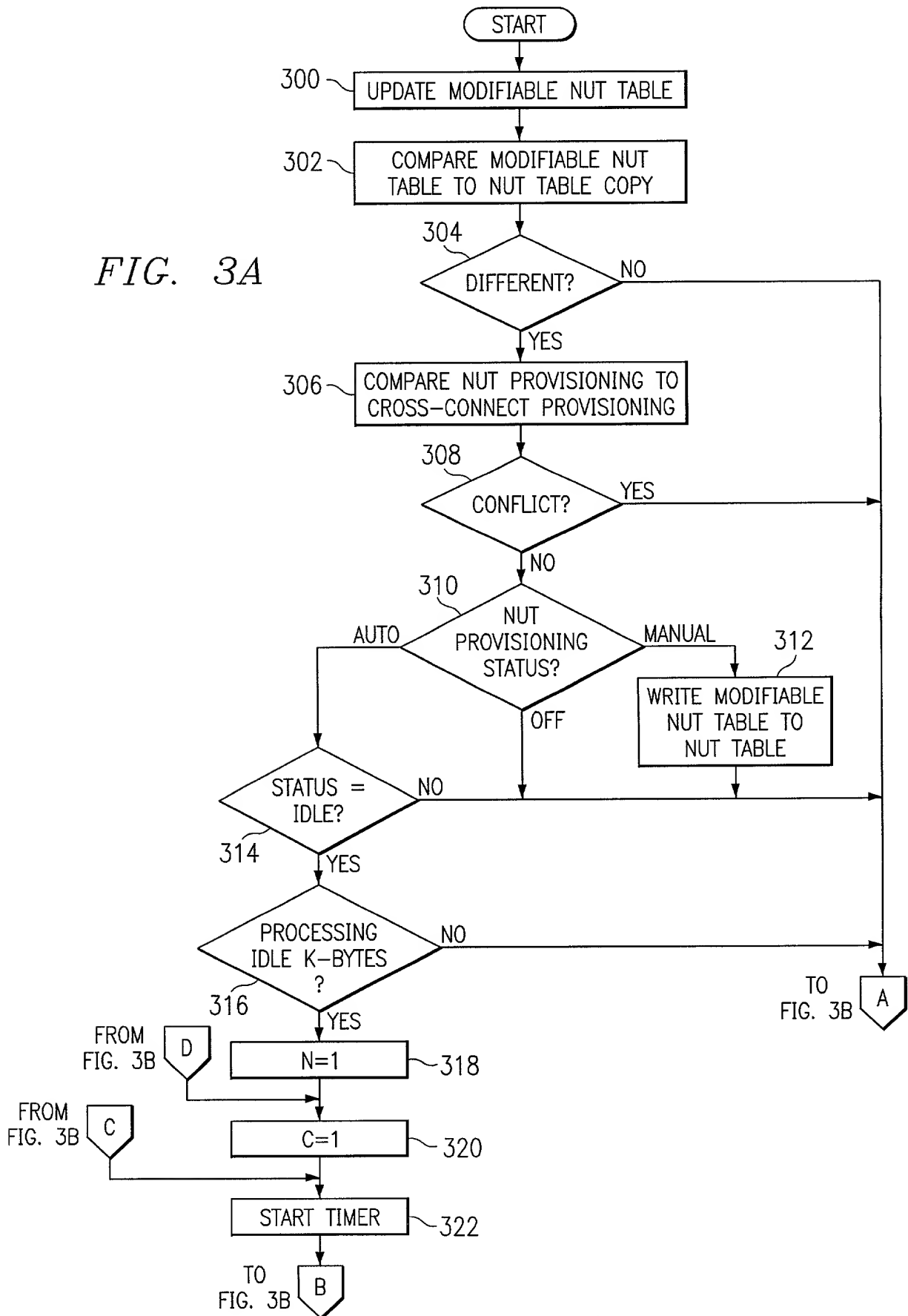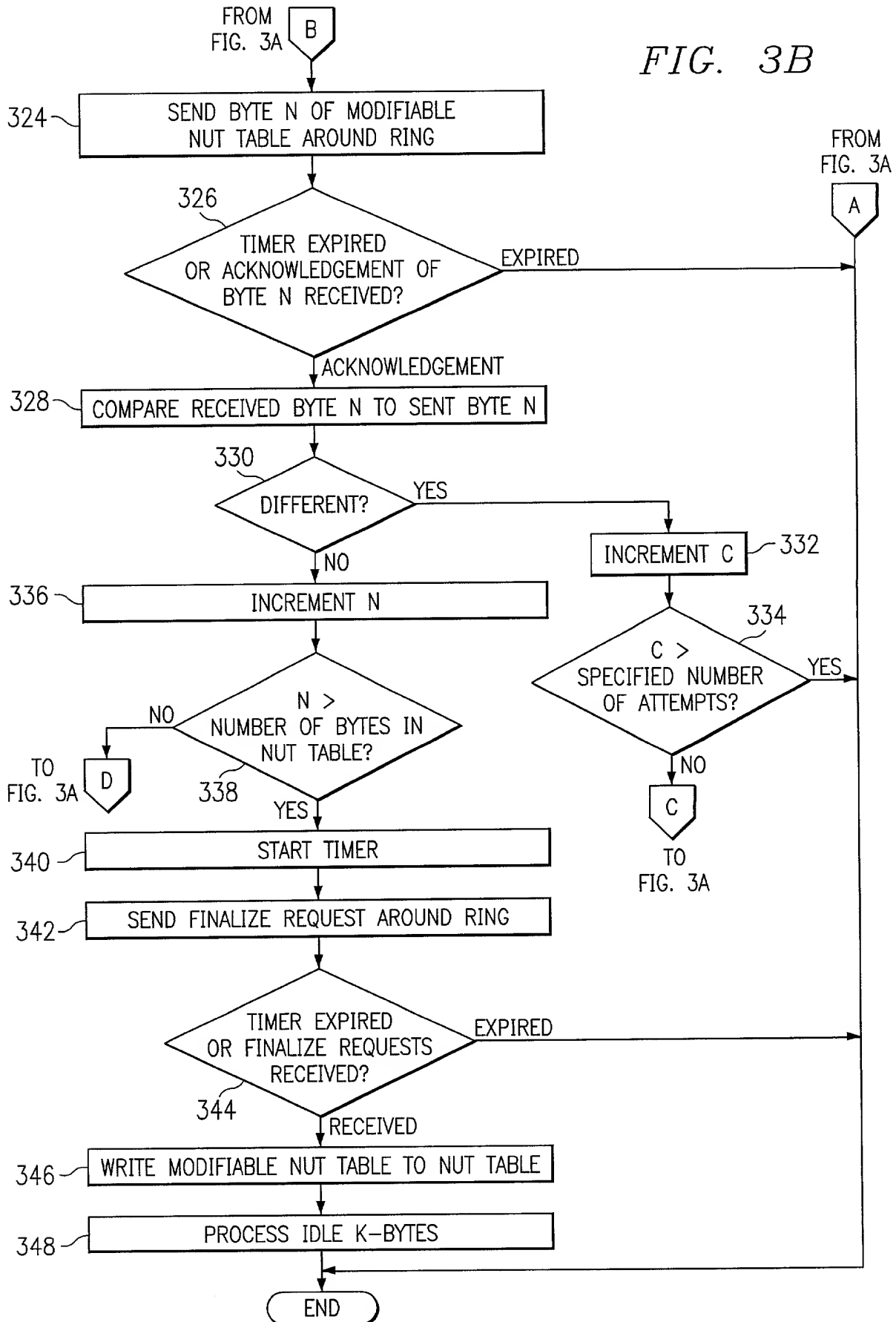Sheet: 3 of 7   Filed: April 30, 2001

FIG. 3B

FROM
FIG. 3A → **B**

324 — SEND BYTE N OF MODIFIABLE NUT TABLE AROUND RING

326 — TIMER EXPIRED OR ACKNOWLEDGEMENT OF BYTE N RECEIVED? — EXPIRED → FROM FIG. 3A **A**

ACKNOWLEDGEMENT

328 — COMPARE RECEIVED BYTE N TO SENT BYTE N

330 — DIFFERENT? — YES → 332 INCREMENT C

NO

336 — INCREMENT N

338 — N > NUMBER OF BYTES IN NUT TABLE? — NO → TO FIG. 3A **D**

334 — C > SPECIFIED NUMBER OF ATTEMPTS? — YES → (to A)

NO → **C** TO FIG. 3A

YES

340 — START TIMER

342 — SEND FINALIZE REQUEST AROUND RING

344 — TIMER EXPIRED OR FINALIZE REQUESTS RECEIVED? — EXPIRED →

RECEIVED

346 — WRITE MODIFIABLE NUT TABLE TO NUT TABLE

348 — PROCESS IDLE K-BYTES

END

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START

400

STATUS = IDLE? —— NO

YES

402

PROCESSING IDLE K–BYTES ? —— NO

YES

404 — RECEIVE NUT TABLE BYTE

406 — PASS NUT TABLE BYTE

408 — RECEIVE ACKNOWLEDGEMENT

410 — PASS ACKNOWLEDGEMENT

412 — COMPARE NUT TABLE BYTE TO ACKNOWLEDGEMENT

DIFFERENT? —— YES

414

NO

416 — UPDATE MODIFIABLE NUT TABLE

418 — RECEIVE FINALIZE REQUEST

420 — COMPARE NUT PROVISIONING TO CROSS–CONNECT PROVISIONING

422

CONFLICT? —— YES

NO

PARITY MATCH? —— NO

YES   424

426 — PASS FINALIZE REQUEST

428 — RECEIVE SECOND FINALIZE REQUEST

430 — PASS SECOND FINALIZE REQUEST

432 — WRITE MODIFIABLE NUT TABLE TO NUT TABLE

END

FIG. 4

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FIG. 5

START

500 — STATUS = IDLE? —NO→

↓YES

502 — PROCESSING IDLE K—BYTES? —NO→

↓YES

504 — RECEIVE NUT TABLE BYTE

506 — SECOND NUT TABLE BYTE RECEIVED? —NO→

↓YES

508 — NUT TABLE BYTES IDENTICAL? —NO→

↓YES

510 — SEND ACKNOWLEDGEMENT

512 — UPDATE MODIFIABLE NUT TABLE

514 — RECEIVE FINALIZE REQUEST

516 — SECOND FINALIZE REQUEST RECEIVED? —NO

↓YES

518 — PARITY MATCH? —YES→

↓NO

520 — COMPARE NUT PROVISIONING TO CROSS—CONNECT PROVISIONING

CONFLICT? —YES→

↓NO 522

524 — SEND FINALIZE REQUEST AROUND RING

526 — WRITE MODIFIABLE NUT TABLE TO NUT TABLE

528 — CLEAR ANY NUT MISMATCH ALARM

END

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FIG. 6

```
              ( START )
                  │
                  ▼
600 ── RECEIVE TOPOLOGY MAP
                  │
                  ▼
602        ◇ NUT PROVISIONNG ──NO──┐
             STATUS = AUTO         │
                  ?                 │
                  │YES             │
                  ▼                 │
604 ── GENERATE NUT MISMATCH ALARM │
                  │                 │
                  ▼                 │
606        ◇ STATUS = ──NO─────────┤
               IDLE?                │
                  │YES             │
                  ▼                 │
608        ◇ PROCESSING ──NO───────┤
             IDLE K-BYTES           │
                  ?                 │
                  │YES             │
                  ▼                 │
610 ── COMPARE NUT PROVISIONING TO │
        CROSS-CONNECT PROVISIONING  │
                  │                 │
                  ▼                 │
           ◇ CONFLICT? ──YES────────┤
           612    │NO              │
                  ▼                 │
614 ── SEND START REQUEST          │
           AROUND RING              │
                  │                 │
                  ▼                 │
616 ── DESTINATION NODE FOR        │
        START REQUEST RECEIVES      │
           START REQUESTS           │
                  │                 │
                  ▼                 │
618 ── DESTINATION NODE BECOMES    │
        PROVISIONING NODE AND       │
         INITIATES DISTRIBUTION     │
            OF NUT TABLE            │
                  │                 │
                  ▼◄────────────────┘
              ( END )
```

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700

702 — K1 BYTE

BITS 1-4	DESCRIPTION
1111	LOCKOUT OF PROTECTION (LOP)
1110	SEND NUT BYTE #1
1101	FORCED SWITCH (FS-R)
1100	SEND NUT BYTE #2
1011	SIGNAL FAILURE (SF-R)
1010	SEND NUT BYTE #3
1001	START/FINALIZE REQUEST
1000	SIGNAL DEGRADE (SD-R)
0111	ACKNOWLEDGE NUT BYTE #1
0110	MANUAL SWITCH (MS-R)
0101	WAIT TO RESTORE (WTR)
0100	ACKNOWLEDGE NUT BYTE #2
0011	EXERCISER (EXER-R)
0010	ACKNOWLEDGE NUT BYTE #3
0001	REVERSE REQUEST (RR-R)
0000	NO REQUEST (NR)
BITS 5-8 (714)	DESTINATION NODE ID

704 — K2 BYTE (716)

	DESCRIPTION
BITS 1-4 (720)	SOURCE NODE ID
BIT 5 (722)	SHORT OR LONG PATH REQUEST INDICATION
BITS 6-8 (724)	DESCRIPTION
111	LINE AIS
110	LINE RDI
101	LINE LDI (LOCAL DEFECT INDICATION)
100	INVALID (RESERVED)
011	EXTRA TRAFFIC
010	BRIDGED AND SWITCHED (BR&SW)
001	BRIDGED (BR)
000	IDLE

(730) / (718)

NUT K2	NUT TABLE DATA FOR SEND/ACK #1-3
FINALIZE	K2 = PQRX XXX0 (SEE BELOW FOR PQR)
START (732)	K2 = XXXX XXX1
	P = PARITY OF FIRST BYTE OF NUT TABLE
(734)	Q = PARITY OF SECOND BYTE
	R = PARITY OF THIRD BYTE

FIG. 7